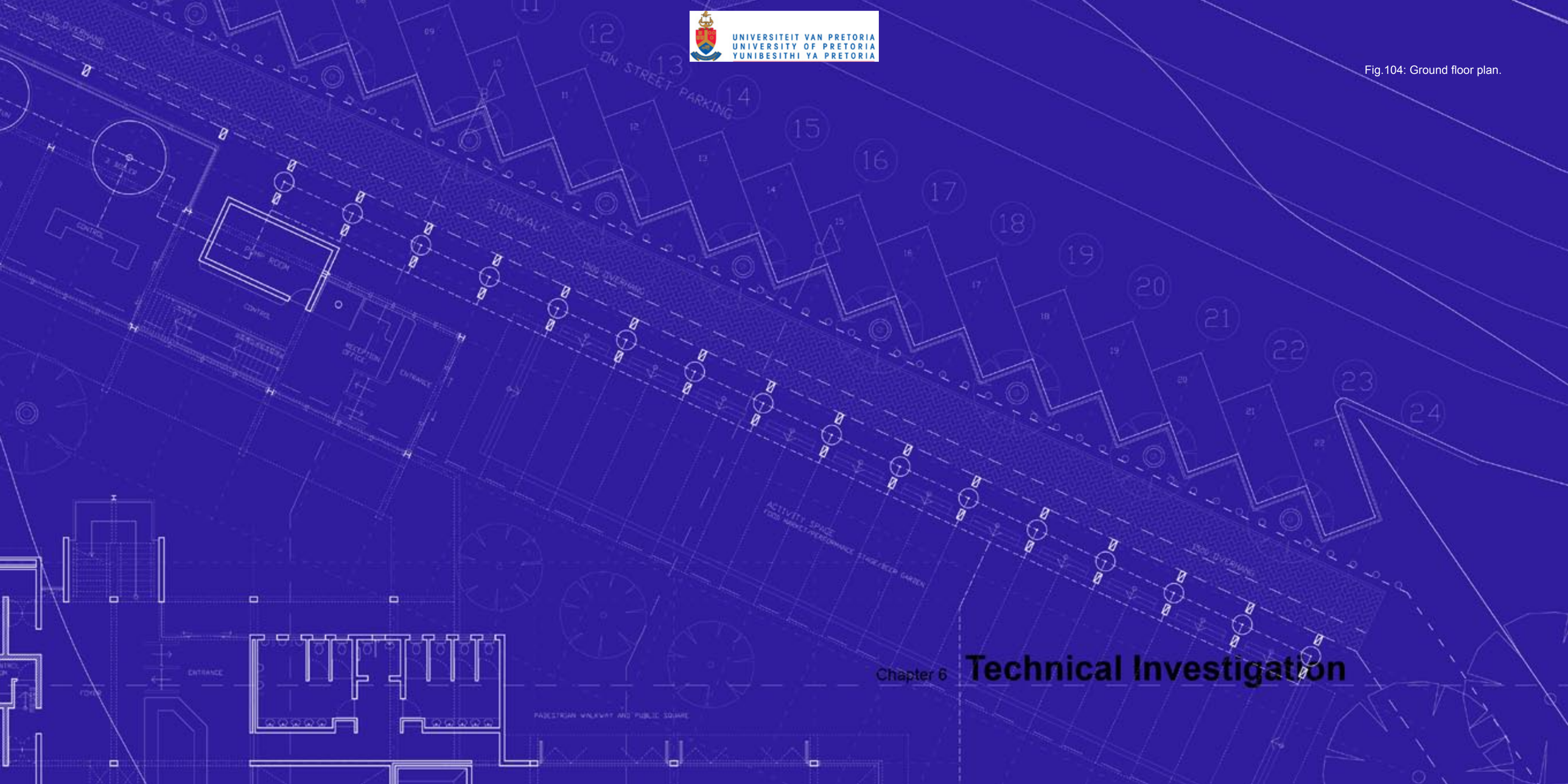


Fig.104: Ground floor plan.

6.1 Columns and beams

6.1.1 steel

Two types of steel construction are used in parts of the building where transparency is required (Fig. 107). The brew house and the area housing the maturing flasks are constructed with an H-section beam and column system. The H-sections are 254 x 254mm in size and positioned on a 7meter by 6 meter grid. The fermentation flasks adjacent to the activity platform are supported by 488 x 254mm steel columns constructed from 40 x 40mm steel equal leg angles (Fig. 105). The angles are arranged in a space frame made up of triangles.

Fig.105: Columns supporting the fermentation flasks.

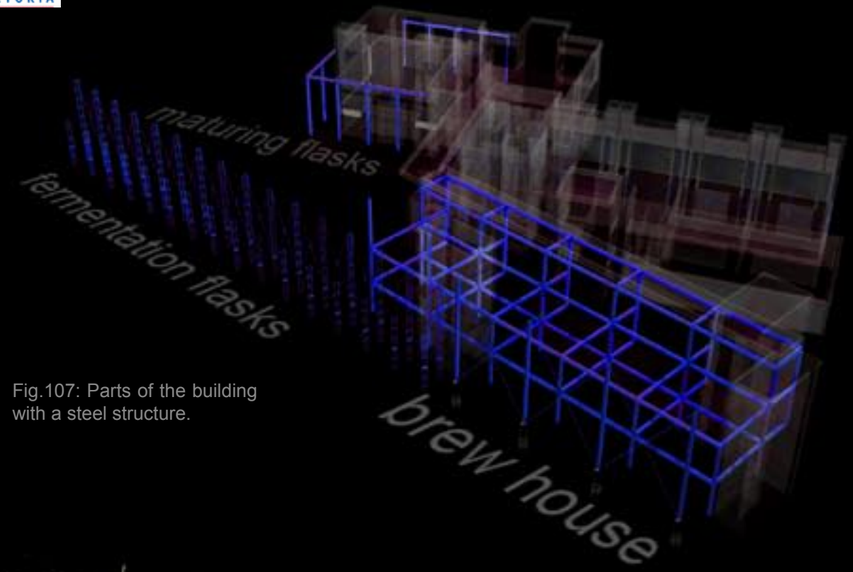
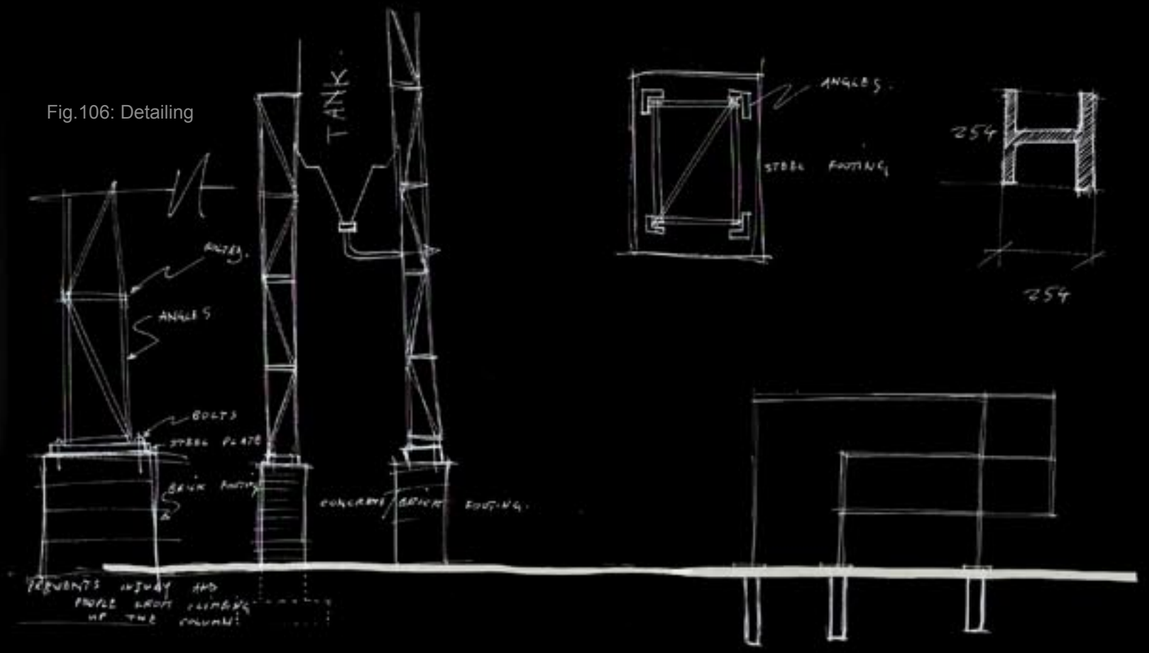


Fig.107: Parts of the building with a steel structure.

Fig.106: Detailing



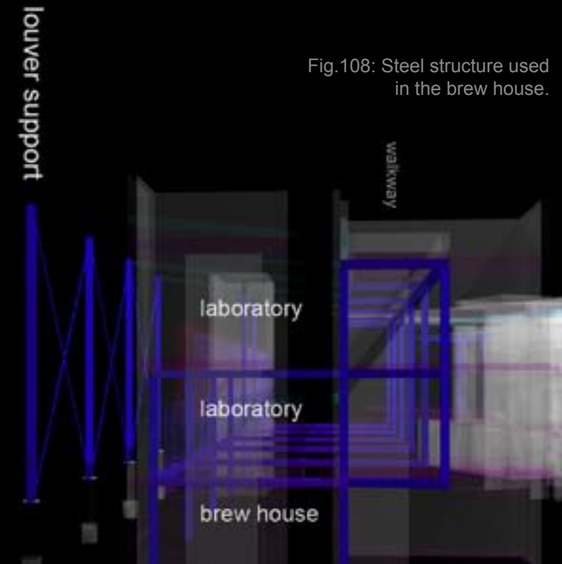


Fig.108: Steel structure used in the brew house.

6.1 Columns and beams

6.1.2 concrete

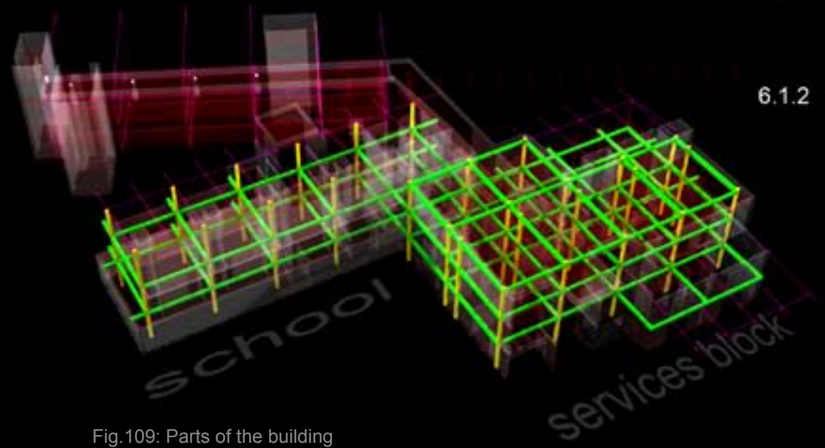


Fig.109: Parts of the building with a concrete structure.

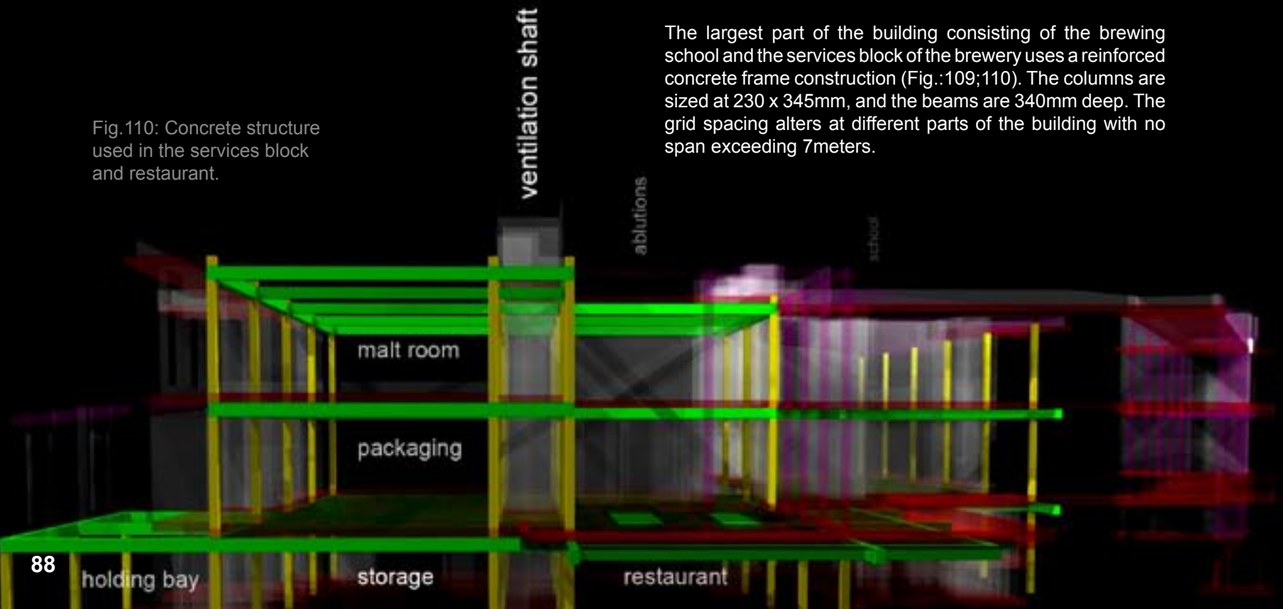


Fig.110: Concrete structure used in the services block and restaurant.

The largest part of the building consisting of the brewing school and the services block of the brewery uses a reinforced concrete frame construction (Fig.:109;110). The columns are sized at 230 x 345mm, and the beams are 340mm deep. The grid spacing alters at different parts of the building with no span exceeding 7meters.

6.2 Floor slabs

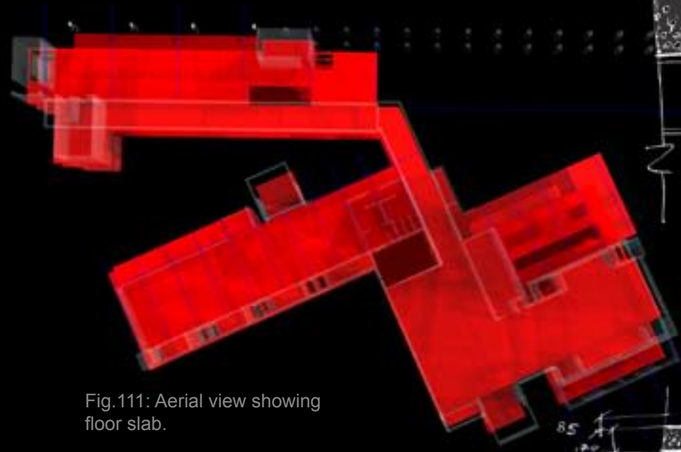
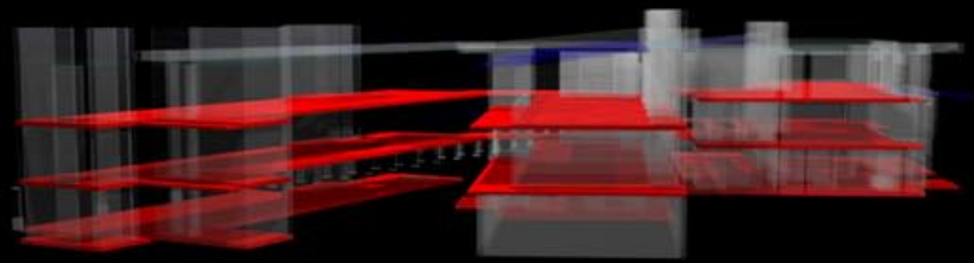


Fig.111: Aerial view showing floor slab.

Conventional reinforced concrete slabs of 255mm are used in those parts of the building supported by a concrete frame construction (Fig: 114). Those areas where a steel frame construction is used, permanent shutter slabs are utilised (Fig:113).

Fig.112: Perspective view showing floor slab.



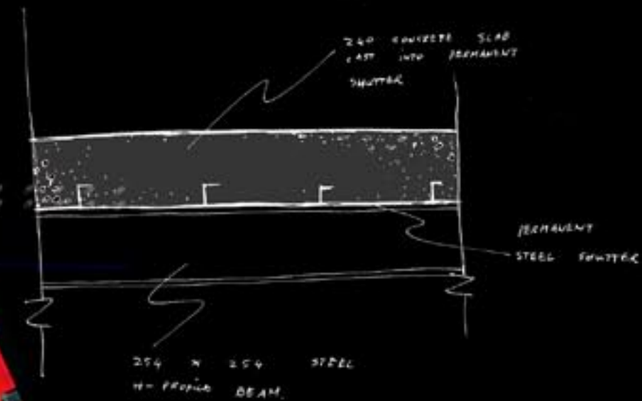


Fig.113: Permanent shutter concrete floor slab used in the brew house.

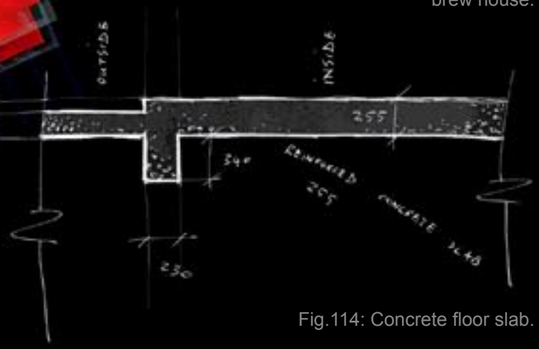
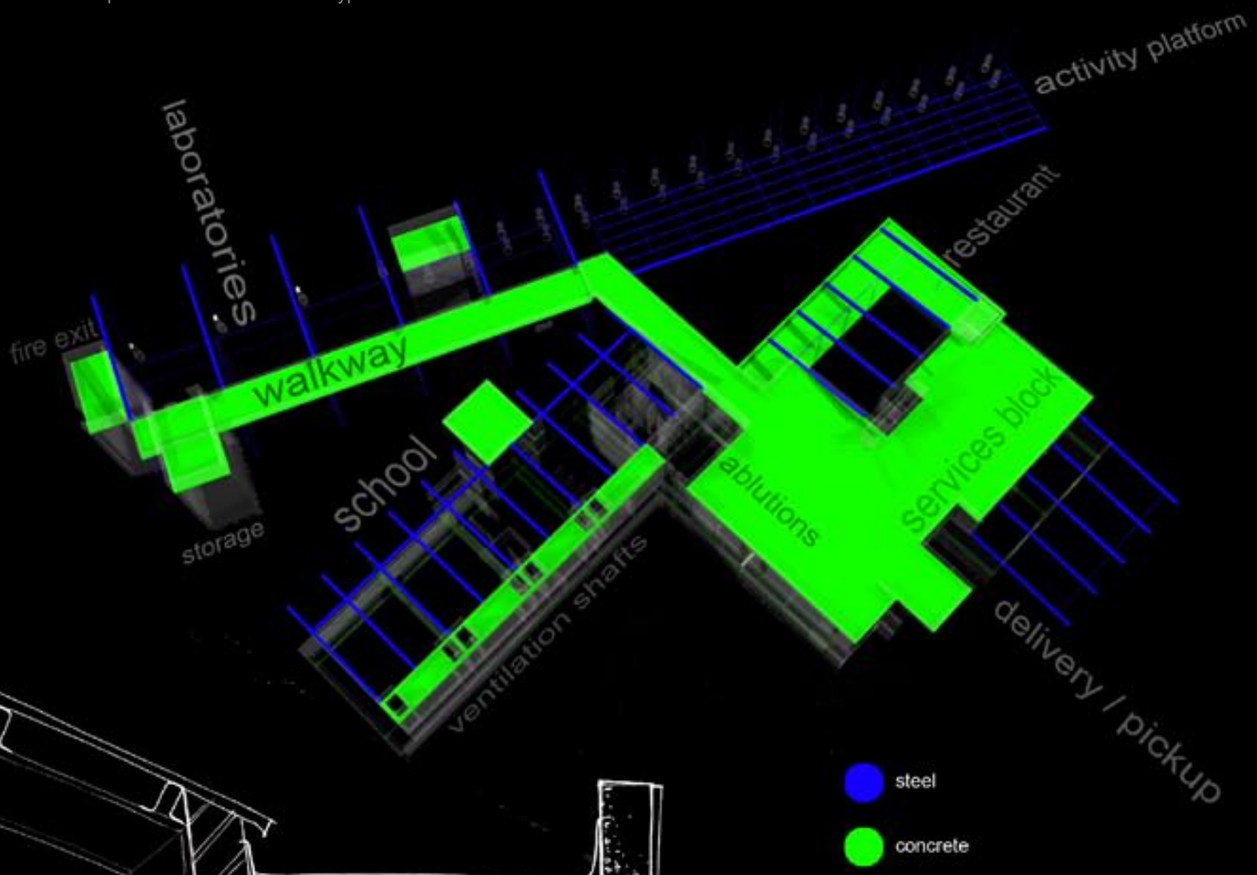


Fig.114: Concrete floor slab.

Fig.115: Aerial view showing placement of different roof types.



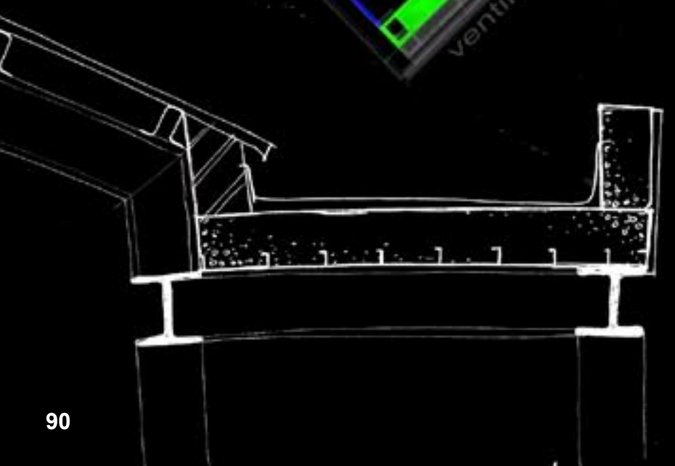


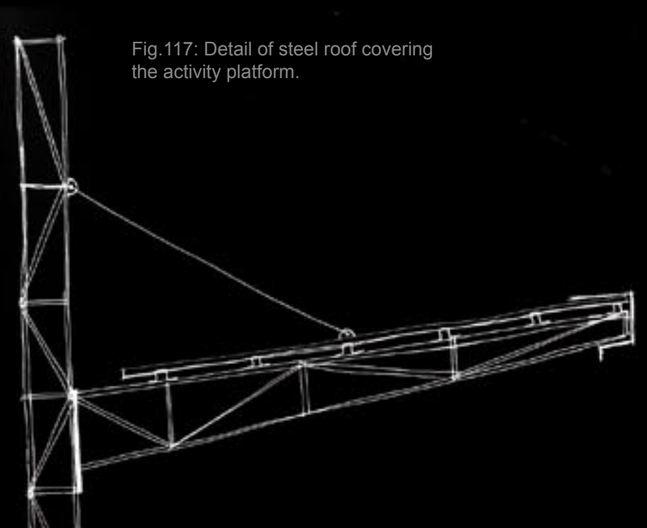
Fig.116: Detail of permanent shutter concrete roof used in the brew house.

6.3 roof construction

Concrete: Reinforced concrete roof slabs of 255mm are used in part of the building supported by a concrete frame construction. Permanent shutter concrete slabs are used in parts of the building with a steel structure.

Steel: 254 x 254 H-section beams sloped at a 5º are used in parts of the building with a steel frame construction. Trusses constructed from 40x40mm steel equal leg angles support the roof that suspends over the activity platform and are fixed to the same columns that support the fermentation flasks.

Fig.117: Detail of steel roof covering the activity platform.



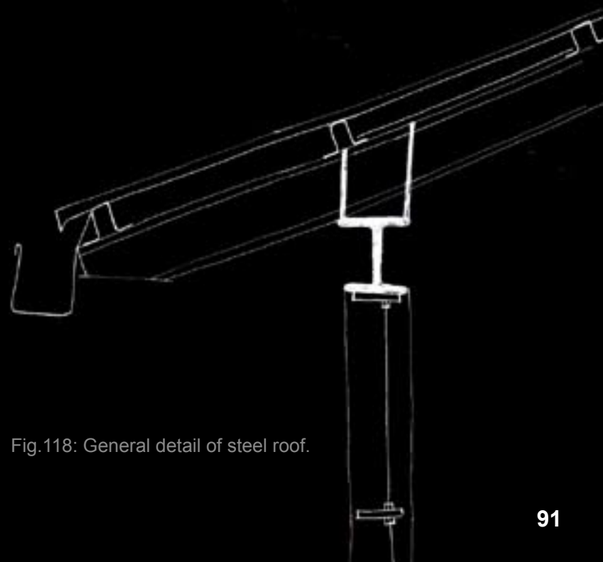


Fig.118: General detail of steel roof.

6.4 Service cores

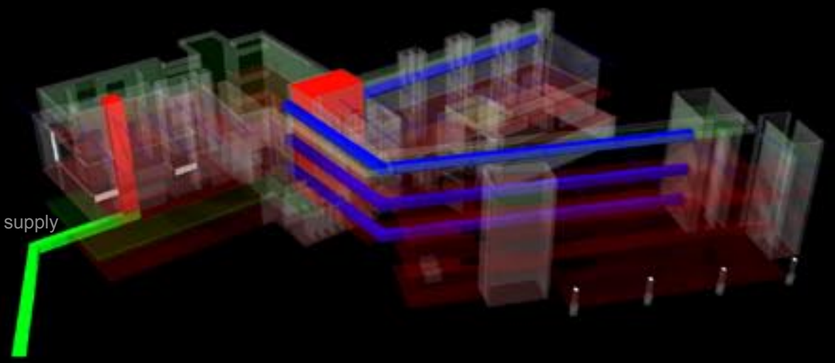


Fig.119: Services
Red: Service cores
Blue: Filtered water supply
Green: Beer pipes

A service core of 6 x 4 meters is positioned in the middle of the building. It facilitates the sewerage pipes from the ablutions on all level and the extractor fans for the kitchen on the ground level. It is also a central control point from where filtered water moves to the brew house and laboratories. The service core is accessible on the ground floor from the kitchen and from the bridge on the first and second floor.

A second smaller service core of 1,4 x 1,7 meters is positioned between the maturing flask room and the services block. It facilitates the pipes carrying beer between the fermentation flasks and the maturing flasks. It is accessed from the ground level and is exposed on the first level to the kegging room.

6.5 Ventilation system

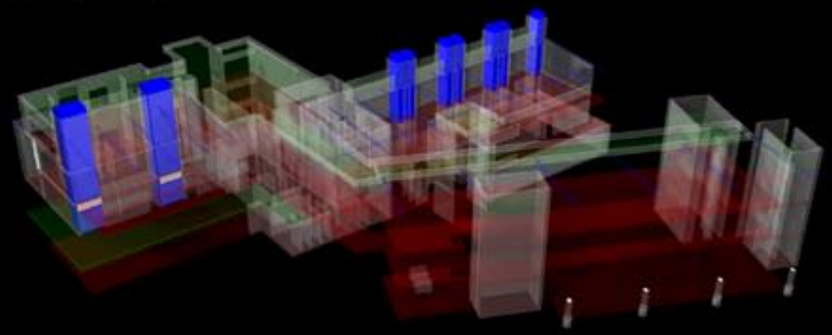


Fig.120: Ventilation shafts

The general world view at present is largely focused towards sustainable development. In terms of thermal comfort, mechanical ventilation requires massive amounts of electricity and are major contributors to this problem. For this reason the building uses a passive ventilation system.

The design of the brewery allows cross ventilation to only be possible in the brew house. The school is placed flush to an existing building on the southern façade making cross ventilation impossible. For this reason ventilation ducks are ordered around the columns in a manner that allows all three levels to be passively ventilated. The ducts penetrate the first floor slab which opens to the auditorium, and draws in air though the floor. In the classrooms on the first floor, and in the research laboratory on the second floor, air is drawn into the room through the windows on the northern façade and out through the ventilation shafts on the southern side of the building.

In the brewery services block and restaurant, functions need to be physically separated. This does not allow for cross ventilation. In addition the distance from the southern side of the building to the northern side is too far for this process to work correctly, and ventilation in an east west direction is prevented for the same reason as in the school. Ventilation ducts are placed between the restaurant and services block drawing air through the northern façade of the restaurant and through the southern façade of the services block.

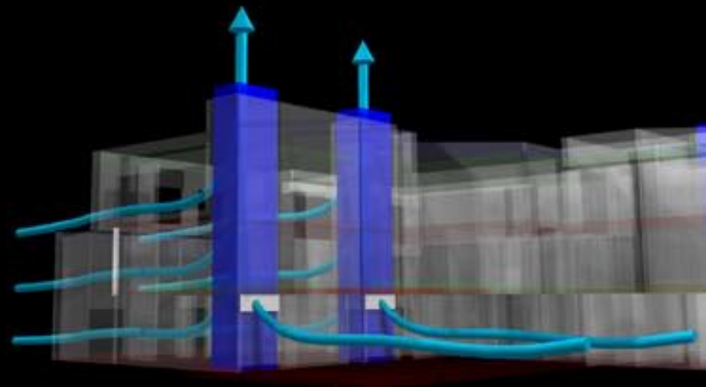


Fig.121: Ventilation system in services block and restaurant.

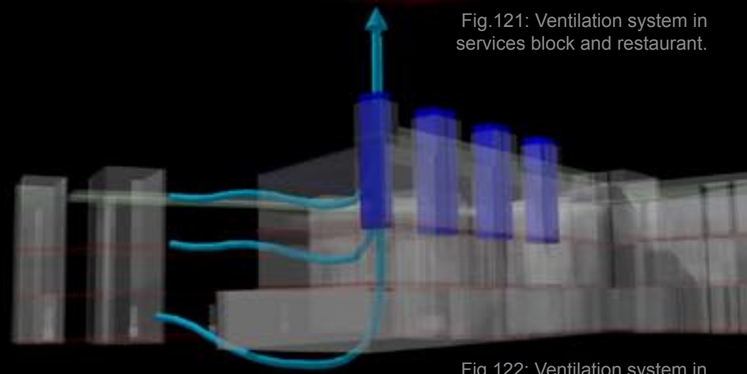


Fig.122: Ventilation system in brewing school.

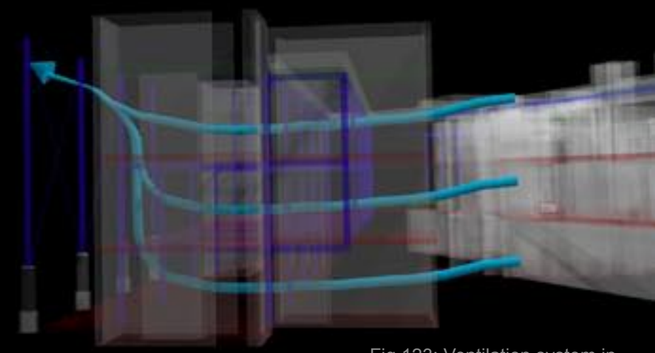


Fig.123: Ventilation system in brew house.

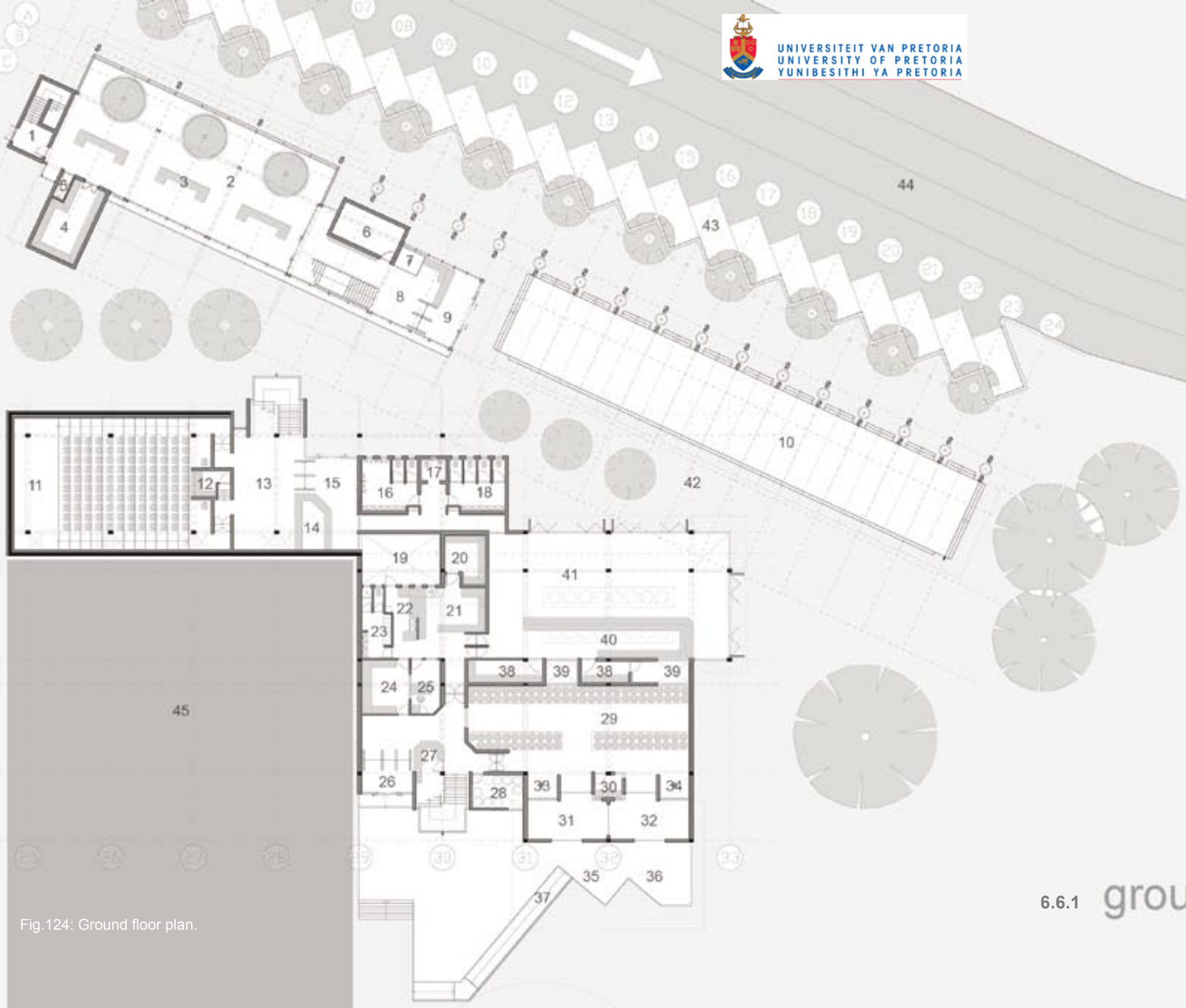


Fig.124: Ground floor plan.

1. Fire exit
2. Brew house
3. Control panels
4. Store room
5. Employee ablution
6. Pump room
7. Lift
8. Reception
9. Entrance
10. U/C activity platform
11. Auditorium
12. Control room
13. Foyer
14. Reception office
15. Entrance
16. Male ablutions – Auditorium/Restaurant
17. Paraplegic ablution – Auditorium/Restaurant
18. Female ablution – Auditorium/Restaurant
19. Service yard
20. Cold room
21. Kitchen preparation
22. Kitchen wash-up
23. Locker room
24. Dry store
25. Restaurant managers office
26. Service entrance
27. Security
28. Refuse yard
29. Mass storage
30. Security office
31. Holding bay 1
32. Holding bay 2
33. Raising platform
34. Raising platform
35. Delivery bay 1
36. Delivery bay 2
37. Ramp
38. Bar storage
39. Ventilation shafts
40. Bar
41. Restaurant
42. Public walkway
43. On street parking
44. Struben Street
45. Existing building

6.6.1 ground floor plan

0 1 2 3 4 5 10 20

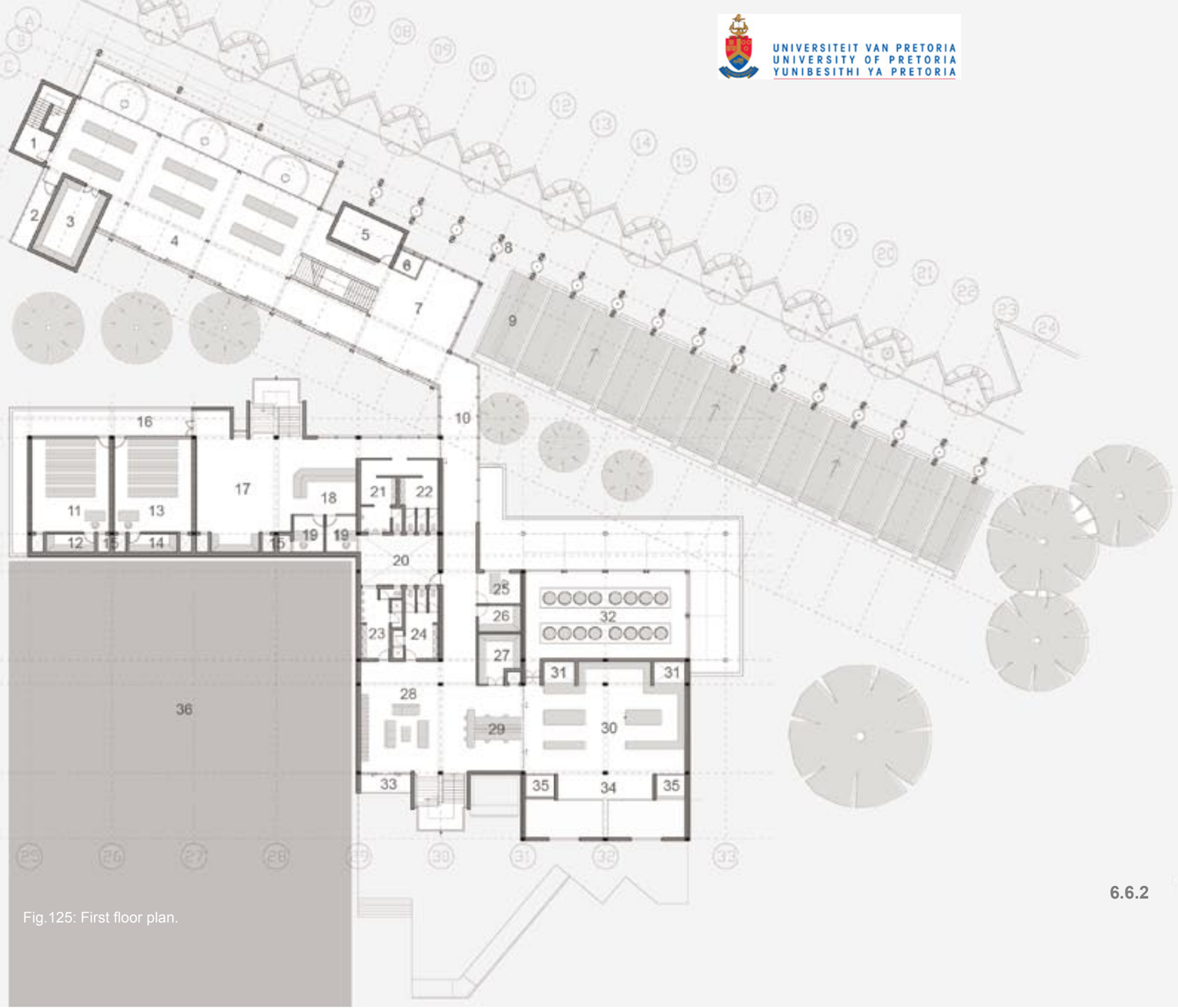


Fig.125: First floor plan.

1. Fire exit
2. Balcony
3. Store room for laboratory
4. Research laboratory
5. Chiller room L1
6. Lift
7. Communal office for brewers
8. Fermentation flasks x 16
9. Roof over activity platform
10. Bridge
11. Classroom 1
12. Classroom 1 storage
13. Classroom 2
14. Classroom 2 storage
15. Ventilation shaft
16. Balcony
17. School circulation – notice boards/information/display
18. Open Office
19. Office
20. Service Yard
21. Male ablutions for school
22. Female ablutions for school
23. Male ablutions for brewery
24. Female ablutions for brewery
25. Brew master’s office
26. General storage for brewery
27. Store room for kegging
28. Lounge with lockers
29. Control office for kegging
30. Kegging room
31. Ventilation shafts
32. Maturing flasks x 16
33. Balcony
34. Intermediate storage between phases
35. Raising platform
36. Existing building

6.6.2 first floor plan 0 1 2 3 4 5 10 20

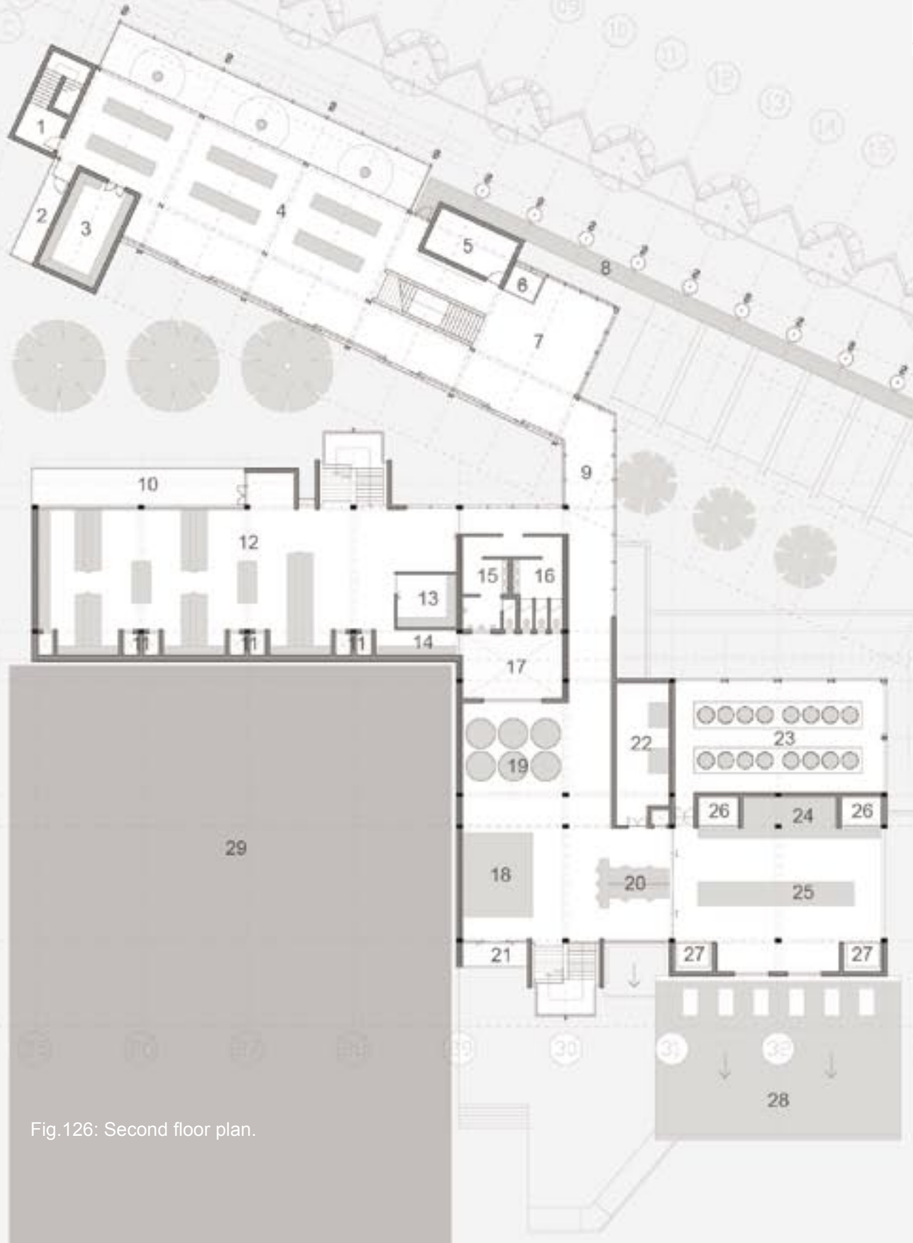


Fig.126: Second floor plan.

1. Fire exit
2. Balcony
3. Store room
4. Research laboratory
5. Chiller room L2
6. Lift
7. Communal office for brewers
8. Walking platform to service fermentation flasks
9. Bridge
10. Balcony
11. Ventilation shafts
12. School research laboratory
13. Store room for research laboratory
14. Kitchenette
15. Male ablutions for brewery
16. Female ablutions for brewery
17. Service yard
18. Water filter
19. Tanks holding filtered water
20. Control office for roaster and grinder
21. Balcony
22. Plant room for maturing room
23. Maturing flasks x 16
24. Grinder
25. Roaster
26. Ventilation shaft
27. Raising platform
28. Roof over service yard and holding bays
29. Existing building

6.6.3 second floor plan

0 1 2 3 4 5 10 20

1. Struben Street
2. On street parking
3. Side walk
4. Fermentation flasks with rotating carbon fiber solar screen
5. Activity platform
6. Public space
7. Restaurant / Brew pub
8. Maturing flasks x 16
9. Ventilation shaft
10. Malt room with grinder and roaster
11. Kegging room
12. Mass storage room
13. Holding bay
14. Pickups / deliveries
15. Service yard

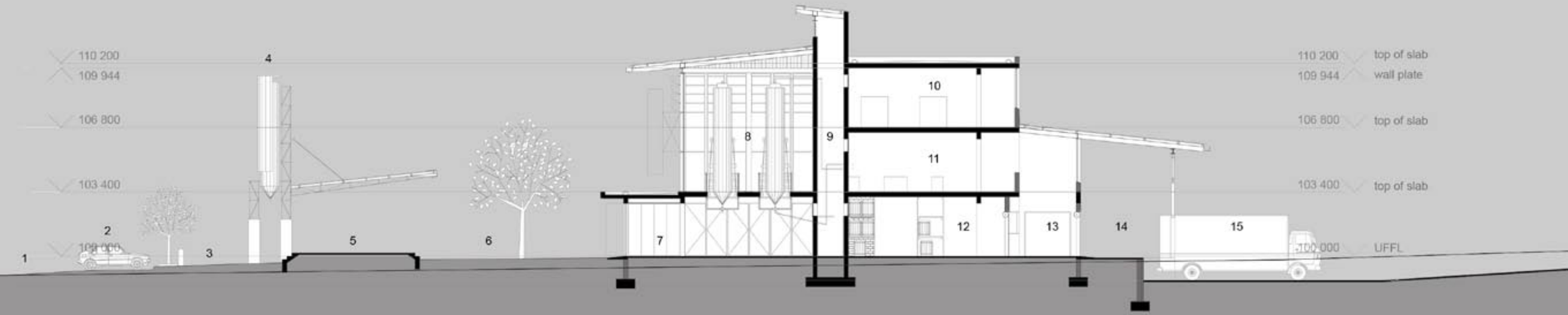


Fig.127: Section A-A

6.7.1 section A-A

0 1 2 3 4 5 10 20

1. Struben Street
2. On street parking
3. Side walk
4. Brew house
5. Research laboratory L1
6. Research laboratory L2
7. Public space
8. Auditorium
9. Class room
10. School research laboratory
11. Ventilation shaft
12. Existing building

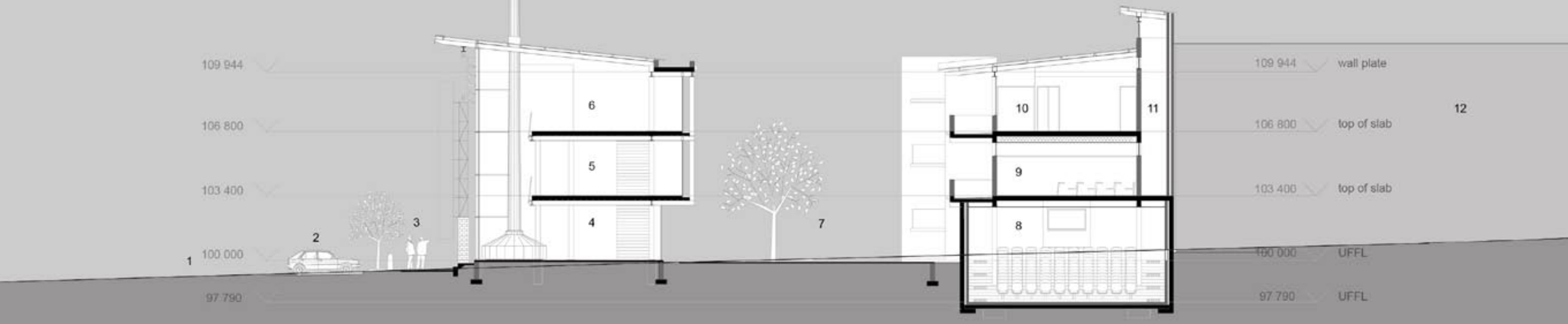


Fig.128: Section B-B

6.7.2 section B-B

north elevation 0 1 2 3 4 5 10 20

Fig.129: North elevation.

south elevation

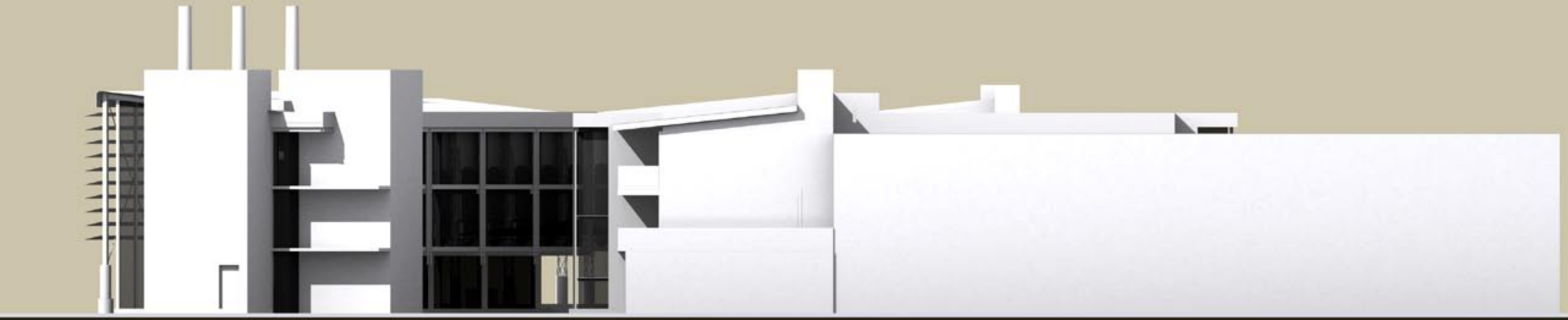
0 1 2 3 4 5 10 20

Fig.130: South elevation

east elevation

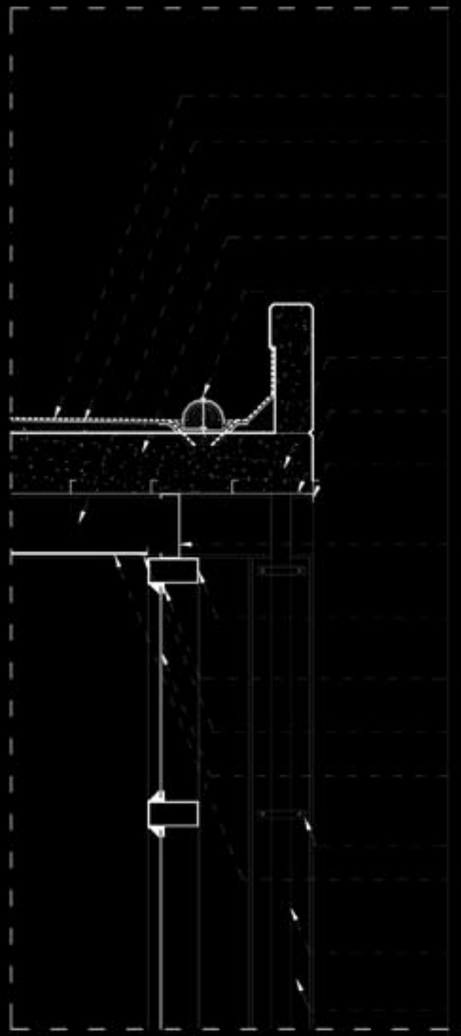
0 1 2 3 4 5 10 20

Fig.131: East elevation



west elevation

Fig.132 West elevation



torch on water proofing membrane installed as per manufacturers specifications

40 mm min. screed @ 1:70 fall towards rain water inlet

254 x 254 mm steel H-profile beam

240 mm reinforced concrete roof slab cast in permanent shutters as per engineer specification

cast iron fulbore cast into concrete roof slab and waterproofing to manufacturers specifications

80 mm Ø uPVC rain water pipe cast into roof slab

2 mm steel QC flooring @ 320mm cc installed as per manufacturers specifications

35 x 35 x 2 mm steel equal legged angle fixed to bottom of steel shutter and concrete roof slab with M8 chemical bolt

254 x 70 x 20 mm steel lip channel fixed to bottom steel shutter and concrete roof slab with M8 chemical bolt and spot welded to H-profile columns

200 x 100 x 8 mm aluminum window structure pop rivited to steel lip channel and vertical aluminum window column

65 x 40 mm custom made aluminum window frame fixed to rectangular aluminum window structure

30 x 30 x 2.5 mm steel equal leg angle spot welded to H-beams

6mm clear laminated safety glass connected and sealed with clear silicone sealant

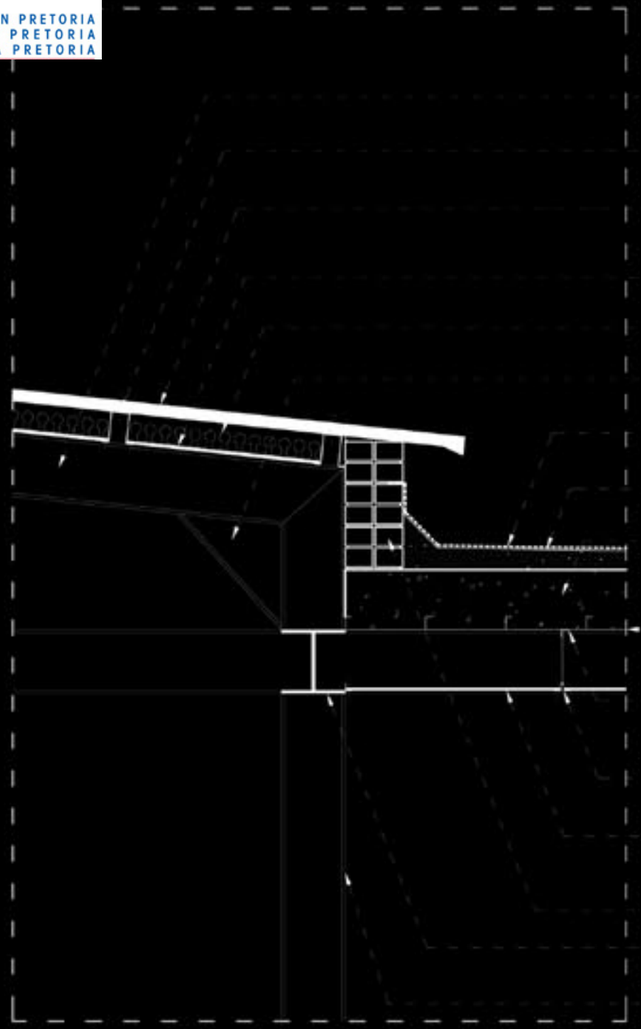
30 x 4 mm galvanised steel downpipe clamp bolted to steel H-column with M8 galvanised steel bolts

8 mm fibre-cement ceiling board screwed to purpose made steel bracket and steel angles as per manufacturers specifications

85 mm Ø galvanised steel downpipe fixed to galvanised steel clamp

254 x 254 mm steel H-profile column

detail 1: *brew-house roof*



254 x 146 x 31 steel I-profile roof beam factory welded to architects specification

125 x 75 x 3.5 mm steel top-hat purlin spot welded to I-profile roof beam @ 850mm cc.

0.8 mm brownbuilt roof sheeting @ 6°fixed to purlins with patent cleats as per manufacturers specifications

8 mm fibre-cement ceiling board screwed to top-hat purlins as per manufacturers specifications

75 mm mineral fibre thermal insulation blanket laid ontop of cealing

8 mm steel flat bar factory welded to architects specifications

torch on water proofing membrane installed as per manufacturers specifications

40 mm min. screed @ 1:70 fall towards rain water inlet

240 mm reinforced concrete roof slab cast in permanent shutters as per engineer specification

2 mm steel QC flooring @ 320mm cc installed as per manufacturers specifications

35 x 35 x 2 mm steel equal legged angle fixed to bottom of steel shutter and concrete roof slab with M6 chemical bolt

2.5 mm steel bracket custom made to architects specification

8 mm fibre-cement ceiling board screwed to purpose made steel bracket as per manufacturers specifications

modular brick masonry wall

254 x 254 mm steel H-profile beam

254 x 254 mm steel H-profile column

detail 2: *brew-house roof*